

**LONG-TERM VISION/GOALS FOR IMPROVED NOS
MONITORING ACTIVITIES
and
FY02 BUDGET INITIATIVES
V1.0
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A. Long Term Vision and Goals

1. NGS will continue its leadership role as the foremost civilian positioning and remote sensing experts. In doing so, NGS will continue to monitor the National Continuously Operating Reference Station network, which provides the fundamental framework for the National Spatial Reference System (NSRS). NGS will also continue to monitor subsidence and ocean-loading deformation networks, whose primary purpose is to gauge the effect of geophysical processes on the NSRS. The data will continue to be made available to the public. NGS will acquire new remote sensing technologies to monitor the coast in response to customer needs. This would include highly accurate digital elevation models derived from Digital Photogrammetry, Light Detection and Ranging, Synthetic Aperture Radar, Hyperspectral, and Satellite Imagery. NGS will continue to develop these innovative techniques and applications of positioning and remote sensing technologies as well as providing guidance and best-practices.
2. The CCMA monitoring program will develop and lead a coordinated national program to monitor and assess anthropogenic impacts on U.S. coastal resources and ecosystems. This program will provide a national capability to measure, understand, analyze, and forecast natural and human-induced environmental change that affects coastal economies, public safety, and the sustained production of ecological goods and services.
3. OR&R will access more reliable baseline information for comparing spill impacts and assessing recovery rates by consistent monitoring of background levels of contaminants within watersheds. Longer-term, consistent funding for monitoring restoration projects is also needed to glean better knowledge as to whether current restoration practices effectively return habitat to an acceptable level of ecosystem functioning. More complete information on these management actions will advance the “state of the art,” increase efficiency, and allow larger scale, more economical habitat restoration in the future.
4. CO-OPS vision is continue development of the NWLOP and increase the number of stations in the coastal observation water level networks through the NOAA initiative process. It is also seeking to increasingly integrate coastal observation programs with the National Weather Service as is now being done with the NWS Southern Region and NDBC.

CO-OPS will continue to provide new products and services for HAZMAT and storm surge applications and new products for NOAA nautical charting program support. CO-OPS will continue to conduct non-real-time current meter surveys at locations critical to the navigation community for the purpose of upgrading tidal current prediction products.

CO-OPS plans to continue active development of the CO-OPS Web Home Page which allows users access to data, information, and products through controlled queries to the data bases. Specialized Web pages will be developed for specific uses, such as a Hazards Home Page populated during specific storm or HAZMAT events. Historical data will continue to be quality-controlled, loaded onto the data bases and made available over the CO-OPS Home page. CO-OPS philosophy continues to have all data made available to all users over the Web free of charge. CO-OPS strategic plans are to continue to have CO-OPS manage the Center of Data for tide current information and to continue to establish dynamic data base links to other centers of data such as was accomplished with CO-OPS over the past year.

5. CSC's mission is to *foster and sustain the environmental and economic well being of the nation's coast by linking people, information, and technology*. Although CSC does not routinely engage in operational monitoring programs, it works with partners to build their capacity to acquire coastal data and information in a more reliable and efficient manner. Often, this may include collection of baseline data sets. Reflecting this approach, the ongoing projects listed below focus on technology development and capacity building rather than operational monitoring and could be taken as the foundation for future areas of growth:

- *Coastal Land Cover Change Analysis*. The NOAA Coastal Change Analysis Program in cooperation with state, federal, and university partners, uses remote sensing (aircraft, satellite, and *in situ*) to classify land cover in coastal upland, wetland, and submerged (aquatic vegetation) habitats. Subsequent classifications are used to document changes in these resource areas and help coastal managers understand the consequences of these changes. Expected outcomes of these cooperative projects are the production and use of digital habitat classifications and change analysis
- *Remote Sensing of Coastal and Estuarine Water Quality*. The Center's Coastal Remote Sensing Program undertakes applied research on new aircraft and satellite remote sensing technologies to assess the ability of these sensors to provide information on water quality (as indicated by optical properties) that would be of value to coastal managers. Anticipated outcomes are more cost efficient methodologies for monitoring estuarine water properties. The project is not in itself a monitoring project, but is developing techniques that could be applied to monitoring programs.
- *Coastal Ocean Habitats* CSC will continue to create, integrate, and assemble near-real time and retrospective remote sensing data sets and associated information that is useful for addressing coastal management issues. Specific projects using these data include the detection of long-term seasonal and event-specific trends in water turbidity

and sea surface temperature and the development of a prediction and monitoring system for harmful algal blooms in the eastern Gulf of Mexico. The Center is also a Coast Watch National Center, receiving both AVHRR and SEAWiFS satellite imagery. Comprehensive information on coastal water variables (biological, optical, and physical) and their trends for U.S. coastal oceans and large estuaries and embayments is developed for a variety of users.

- *Harmful Algal Bloom (HAB) Forecasts.* This project works with NOAA-funded researchers towards the development of a prediction and monitoring system for HABs in US coastal regions.
- *Topographic Change Mapping.* The Coastal Topographic Mapping project is collecting high-resolution topographic and other spatial data sets in response to the need for accurate, timely information on beach and dune field topography
- *Protected Areas GIS (PAGIS)* is an NOS-wide initiative to develop fully integrated GIS, spatial data management, and Internet capabilities at all National Estuarine Research Reserves and National Marine Sanctuaries. CSC has the lead technical role in this project which will provide the infrastructure and baseline data sets for monitoring activities, providing the Reserves the capacity to integrate monitoring results into a coherent spatial framework.

6. OCRM's long-term priority is to stabilize the NERR's base funding for implementing the System-Wide Monitoring Program (SWMP) with subsequent expansion of the habitat and land-use change components of the SWMP.

7. SPO's vision for the long-term vision for the marine protected area monitoring program is to work cooperatively with the Marine Sanctuary and Research Reserves programs in OCRM to further develop and undertake this type of socioeconomic monitoring and assessment on an expanded basis all of NOS's interests in marine protected areas. This would involve initiating one or more monitoring efforts in NOS's protected areas each year, with periodic re-monitoring to develop economic trend information. For marine sanctuaries, this could be timed to provide input to the required Management Plan revisions every five years. The need and timing for a similar effort for NERRS sites is still to be determined.

For the national program, the vision is to fulfill NOAA's commitment to complete the NSRE program, with a possible expansion of the issues investigated or a more intensive survey in selected locations. However, the NSRE only addresses socioeconomic issues related to recreation. We have a broader vision that NOS should lead an effort, in partnership with other Federal, state, and local stakeholders, to undertake a periodic (e.g., every five year) national monitoring/data synthesis activity that would characterize socioeconomic conditions and trends at a coastal county level. This activity would provide information across key economic sectors important to developing sustainable coastal communities and directing national and regional policy. It would be coordinated with the NSRE, but would provide a wealth of additional information on sectors such as ports and commercial fishing that would be of

direct benefit to NOS's state and local constituents, would be designed to support NOS's Tier I national environmental monitoring program, and would provide the information needed to more completely describe the national and regional status of the economic health and value of the coast.

B. FY02 Budget Initiatives to Enhance NOS Coastal Monitoring

1. NGS will participate in the Sustainable Coastal Communities NOS Theme for 2002 and beyond including national shoreline and the demonstration project Glen Cove, NY. Under this initiative, NOAA will request \$1.0 million for this pilot effort to assist local communities in Glen Cove, NY in sustainably revitalizing their waterfronts.

Cost of the entire effort: \$ 1.0M

2. NCCOS will support the Sustain Healthy Coasts goals and the Habitat NOS Theme by proposing:

a. to establish a nationally coordinated program to monitor, map, and assess U.S. coral reef ecosystems. This program will assure the integration of currently disparate programs/projects being operated by various governmental and private entities at local, regional, state, Federal, territorial, and commonwealth levels into a national monitoring network with consistent database design, comparable data sets, and easy-to-use information.

Cost: \$2.0M

b. To implement NOAA's role in the three-tiered National Coastal Monitoring Program. A substantial plan describing this proposed coordinated interagency monitoring is available.

Cost: \$40.0M

3. OR&R does not have any monitoring initiatives for FY02. However, any initiative that affects the quality and frequency of NOS monitoring activities (e.g., NCCOS coral mapping and monitoring, and CO-OP's PORTS program) potentially affects OR&R as a primary user of these generated data.

Cost: \$ 0M

4. CO-OPS will request an increase through the PSN team to ensure effective operation of the NWLOP, provide nationwide support to NWS, USACE, and NOS programs, and to increase the density of coastal observational networks in key areas.

Cost: \$ 2M

5. CSC is not putting forward FY02 Investment Proposals to conduct monitoring programs. The Center is, however, submitting several investment proposals for FY02 that create frameworks for ingesting and integrating data streams from monitoring programs, as summarized below.

Digital Ports (CSC: \$1.0M) This initiative will develop a national spatial data framework approach to port stewardship while developing local place-based implementations in individual harbors. This initiative leverages existing NOS mapping efforts such as the electronic nautical chart (ENC) development and Physical Oceanographic Real-Time System (PORTS). Many of the same spatial data that are necessary for ENC and PORTS are also important when mapping critical habitat, developing dredge material management plans, and identifying habitat restoration sites. This initiative will develop the national standards and protocols of a geographic spatial framework necessary for addressing coastal issues in ports.

Coastal Communities - Recreation, Tourism and Open Space (CSC: \$350K)

We envision working with private industry since their interests and needs are linked to the recreation and tourism issues. By contributing to the development of the National Survey on Recreation and the Environment, and through partnerships with Sea Grant and the NERR networks, the Center will track and integrate human dimension-related data and information into the development of tools, outreach and communications networks, as well as training programs. Specifically, the Center will focus on information that characterizes human use of open space and trends in tourism and recreation, develop methods of spatially-depicting these uses and trends, and pilot test and implement training of local officials in conjunction with networks.

Coral Reef Information Framework (Cost: \$4.0M). Working with established federal, state, territorial, and academic programs in the Pacific, Atlantic, Caribbean, and Gulf of Mexico, this initiative will establish an ongoing process to identify, update, create, or complete maps and other pertinent data for the world's coral reefs. This initiative will also create a system, using web-based technology, to provide interactive access to coral reef-related information and technology.

6. OCRM has developed an initiative to support the water quality and ecological monitoring phases of the NERR's system-wide monitoring program (SWMP). The initiative will complete the build out of the water quality monitoring element of SWMP and embark on the first steps necessary to map habitat change within the NERRS. Habitat mapping will initially focus on the key ecological structuring components of each Reserve and will quantify the magnitude and extent of habitat change in estuarine systems.

Cost: \$ 5.0M

7. Special Projects office. Pending guidance from the SMC on FY02 priorities, the Special Projects Office will work with NOS offices to develop an Investment Proposal to support expansion of the marine protected areas socioeconomic monitoring program.

After further discussion with key program offices, a proposal outlining the need and benefits of a National Coast And Ocean Socioeconomic Monitoring Program will also be developed.

FIRST DRAFT: Office of Coast Survey input for the CEMP

1. Long Term Vision and Goals

OCS will create a quality-controlled, dynamic, relational data base containing the most current depth soundings and features from NOS hydrographic surveys (as well as from selected verifiable non-NOS sources that meet NOS standards) for all geographic coastal areas of the United States. The resulting data base will be made accessible to state coastal resource managers and agencies, universities, other parts of NOAA, other Federal agencies, and the general public; and to design the data base such that it will be beneficial for geographic information system and electronic nautical charting applications.

2. Rationale for Public Access to National Ocean Service Sounding Data Sets

For many years, NGDC, through the National Ocean Survey, has been digitizing analog NOS hydrographic survey data with full quality control of all digitized data (47% of all surveys are now digital). Considerable effort is still required to digitize the remaining analog survey data to complete the population of the digital data base. These digitized data, along with surveys acquired digitally and with data digitized under a project in Ashville, North Carolina, combine to form the NOS Hydrographic Data Base (NOSHDB), a non-relational, “flat-file” data base. The NOSHDB serves as the base source for the sounding and feature data base to be created.

Limitations of the existing NOS “flat file” hydrographic data base are often cited by various organizations, including the National Marine Fisheries Service, National Weather Service, U.S. Coast Guard, U.S. Geological Survey, U.S. Army Corps of Engineers, and Mineral Management Service, as impediments to research that require accurate seafloor models (for example, to aid in predicting currents and water levels) or study alongshore and nearshore processes (such as developing storm surge models), and to the development of new products for the public. Input of the most accurate and current depth information into coastal GIS's and recently developed vector-based electronic charts is also hindered when using the existing non-relational survey data because different vintage data exist for the same area. Currently, if data are needed for a given geographic area, selected hydrographic surveys can only be accessed in their entirety from the NOS “flat file” hydrographic data base. Most major port approaches contain multiple surveys. Each survey, while typically in digital form, may have different limits causing overlaps or “underlaps” of survey areas and may have been surveyed using different technologies at different time periods and on different geographic datums. As a result, a significant amount of time is required to research survey limits, edge match individual surveys, rectify datum differences, and eliminate superseded data for each research project resulting in duplicate effort by different users.

The new data base will give the environmental, coastal zone management, and scientific communities spatial access to a “seamless” quality-controlled data base containing a wealth of the most recent depth sounding and feature data currently residing in “flat file” digital files and on hydrographic smooth sheets. The relational nature of the data base will allow for spatial or geographic querying (as well as querying by survey date, survey method, or sounding type) which is necessary for input into GIS's and electronic

naautical charts. The dynamic aspect of the data base (or ability of the data base to be updated) will allow for access to current soundings and features as new data are acquired. Developing accurate grids with varying cell sizes to be used in automated contouring will be simpler as only the most recent data, as available in this data base, will need to be manipulated.

3. FY02 Budget Initiative(s)

OCS will request an increase through the PSN or SHC teams to digitize the remaining analog hydrographic survey data to complete the population of the digital data base and to create a quality-controlled, dynamic, relational data base containing the most current depth soundings and features from NOS hydrographic surveys (as well as from selected verifiable non-NOS sources that meet NOS standards) for all geographic coastal areas of the United States.

Cost: \$1.8M (over three years)